

Abstract of the Disclosure

A disk drive with a dual-stage actuator has a servo control system with two controllers. One controller is a dual-stage controller that simultaneously generates a primary actuator control signal and a secondary actuator control signal, and uses a degraded-stability primary actuator controller design with high low-frequency open-loop gain and a secondary actuator controller design that provides stability and high mid-frequency to high-frequency open-loop gain resulting in increased bandwidth. The other controller is a single-stage controller that generates only a primary actuator control signal and uses a stable VCM-only controller design. The single-stage controller is selected if failure of the secondary actuator is detected. Failure of the secondary actuator is detected either by providing a model of the dynamic response of the primary and secondary actuators and comparing the modeled head-position with the measured head-position, or by measuring the position of the secondary actuator relative to the primary actuator with a relative-position sensor and comparing the relative position to a modeled position of the secondary actuator.